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## THE ROUND CHURCHES OF ENGLAND. V.

LITTLE MAPLESTEAD CHURCH, ESSEX.

We have mentioned that the Grand Master of the Temple, Arnold de Torroge, died on his journey to England, as he travelled in company with the patriarch Heraclius, on a mission to Henry II. He was succeeded by Gerard de Riderfort, in 1185. The patriarch returned in disgust and discontent to the Holy Land, for he was unable to persuade the king to perform the promised penance, *i.e.*, to hasten to the succour of the distressed Christians at Jerusalem. Before quitting the king he is said to have used threatenings and warnings, and to have foretold that the monarch would be forsaken of God, since he had at that time forsaken His holy cause. But it appears from authentic records, that this same patriarch was ill qualified to deal out these denunciations on the faults of others, since he was himself living in open contempt of the precepts of the moral law. There is a sad detail of vice and profligacy connected with his name, which we have no intention of laying before our readers, but which we thus allude to, to show what was the state of the Latin church at that time. One of the old chroniclers attributes the loss of Jerusalem to such causes as these, and says, "when Jesus Christ saw the iniquity and wickedness which they committed, in the very place where He was crucified, He could no longer suffer it."

The period of the truce with Saladin was passed by the Templars and the rest of the Christians in ineffectual endeavours to gain sufficient strength for the coming contest, and, unfortunately, in stormy discussions respecting the government of their own kingdom. Meanwhile Saladin was carefully consolidating and strengthening his power, exhorting his followers, and raising their enthusiasm to the highest pitch. The first encounter took place near the brook Kishon, where one of Saladin's sons (*Malek-el-Afdal*, Most excellent Prince), at the head of seven thousand Mussulmen, cut to pieces a body of united Templars and Hospitallers, who had rashly engaged with them. The Grand Master of the Hospital was left dead upon the field, and only the Grand Master of the Temple and two knights broke through the ranks of the Moslems and made their escape. This disastrous battle took place on the 10th of May, 1187.

On the 4th of July of the same year the fate of the holy city was decided at the great battle of Tiberias. The Templars led the van of the Christian army against the hosts of Saladin, which amounted to eighty thousand horse and foot, and appeared over the hilly country like "mountains in movement, or like the agitated waves of the sea." The Templars are also described as "horrible in arms, having their whole bodies cased in triple mail." The latter rushed like lions on the infidels and nothing could withstand their furious charge. Saladin set fire to the grass and shrubs between the two armies, and the wind blew the smoke and flames in the faces of the

Christians and their horses. Arabian writers describe the tremendous scene in vivid language. They compare it to the day of judgment, for the day was turned into night, and the face of the sun was obscured. The following extract from one of their writers is given by Mr. Addison: "The sons of paradise and the children of fire then decided their terrible quarrel; the arrows rustled through the air like wings of innumerable sparrows, the sparks flew from the coats of mail and the glancing sabres, and the blood, spurting forth from the bosom of the throng, deluged the earth like the rains of heaven."

To the patriarch Heraclius belonged the duty of bearing the cross in front of the Christian army, but this cowardly ecclesiastic confided the sacred symbol to the care of the bishops of Ptolemais and Lydda. The Moslems were completely victorious in the terrible conflict; the bishop of Ptolemais was slain; the bishop of Lydda was taken captive, together with the King of Jerusalem and the Grand Master of the Temple. The Templars and the Hospitallers were all slain or taken prisoners. Saladin's secretary writes,

I saw the mountains and the plains, the hills and the valleys, covered with their dead. I saw their fallen and deserted banners sullied with dust and with blood. I saw their heads broken and battered, their limbs scattered abroad, and the blackened corses piled one upon another like the stones of the builders: I called to mind the words of the Koran, "The infidel shall say, What am I but dust?" Their king and their cross were captured, that cross before which they bow the head and bend the knee; which they bear aloft and worship with their eyes; they say that it is the identical wood to which the god whom they adore, was fastened. They had adorned it with fine gold and brilliant stones; they carried it before their armies; they bowed towards it with respect. It was their first duty to defend it, and he who should desert it would never enjoy peace of mind. The capture of this cross was more grievous to them than the captivity of their king. Nothing can compensate them for the loss of it. It *was their god*, they prostrated themselves in the dust before it, and sang hymns when it was raised aloft.

Immediately after the battle Saladin caused the brave Prince Reginald de Chatillon to be beheaded, but reserved the Grand Master of the Temple and the King of Jerusalem in expectation of a splendid ransom.

The concluding scene of this tragedy was enacted on the Christian Sabbath, two days after the battle. All the captives belonging either to the order of Templars or Hospitallers were led to an eminence above Tiberias in full view of the beautiful lake of Gennesareth. There the Moslems were drawn up in battle-array, and there, in the midst of scenery consecrated by the performance of so many of the Saviour's miracles, the captives were called upon to deny their Lord and to embrace the Moslem faith. They refused, to a man, and were all decapitated in the presence of Saladin, by the zealots of his army, and the doctors and expounders of the law. The Knights Templars contested with each other which should be the first to suffer and it was believed by the Christians, in accordance with the superstitious notions of the times, that celestial rays of light played about the corses of the holy martyrs.

Saladin now proceeded rapidly in his conquests: thirty or forty cities and castles fell into his hands; and at length, on the 20th September, he laid siege to the holy city. After fourteen days a breach was made in the walls, and ten banners of the prophet waved in triumph on the ramparts. A solemn procession was made by the Christians to the holy sepulchre to implore the Son of God to save his tomb and his inheritance from impious violation. Females cut off their hair and cast it to the winds (a common eastern token of distress), delicate ladies did penance by standing up to their necks in cold water placed on Mount Calvary. "But the Lord," says one of their writers, "would not listen to any prayer that they made; for the filth, the luxury and the adultery which prevailed in the city, did not suffer prayer or supplication to ascend before God."

The city was surrendered October 2d, 1187, and the Moslems rushed to the Temple in thousands. They defiled the holy places, and hurled down the cross from the pinnacle of the building. When every Christian had been removed from the vicinity of the Temple, Saladin went with great pomp to say his prayers in the "Temple of the Lord," erected by the Caliph Omar. The Temple was consecrated anew to the service of God and Mahomet, and was abundantly purified with rose water.

Eleven important cities and castles of Palestine were delivered to Saladin as ransom for the King of Jerusalem, and the Grand Master of the Temple, and at the commencement of 1188, the latter was again at the head of the brethren of that order. All Christendom was aroused at the news of the capture of Jerusalem, and assistance in men and money were sent from Europe. A large body was thus once more assembled, and on the 4th October, 1189, they laid siege to Acre. Nine pitched battles were fought with various fortune, the Grand Master was slain, and to him succeeded the Knight Templar Brother Walter. He was also slain, and succeeded by Robert de Sablé. The Third Crusade having been preached in Europe by William of Tyre, the Christian army at Tyre received a most valuable reinforcement in the arrival of the combined fleets of France and England, and the presence of Philip Augustus and of the celebrated Richard Cœur de Lion. Six weeks after their arrival, the gates of Acre were thrown open to the warriors of the cross, and the Templars established themselves in what remained from thenceforth the chief house of their order. A most persevering and determined warfare was carried on between the forces of Saladin and the Christian army, and Cœur de Lion gained his full share of renown. The history of the brilliant deeds performed on both sides is a long and interesting one, but we have only to do with its final result, which was the formation of a treaty by which the Christians obtained once more the privilege of visiting Jerusalem as pilgrims, and Tyre, Acre, and Jaffa, with the intervening sea coast, were yielded to them.

Gilbert Horal succeeded Robert de Sablé as Grand Master of the Temple in 1195, and the latter was succeeded by Philip Duplessis in 1201. By the exertions of the Knights Templars and Hospitallers the Latin kingdom was preserved in Palestine after the departure of Richard Cœur de Lion for a period of ninety-nine years. The individuals who next succeeded to the chief government of the Templars, were William de Chartres 1217, Peter de Montaigu 1218, Hermann de Perigord 1236. Some disastrous engagements took place in 1222, and 1236; but these were considered more than counterbalanced by the surrender of Jerusalem into the hands of the Christians, 1242.

Short, however, was the triumph of the followers of the cross, for a new and cruel enemy took away from them their sacred possession in 1244. The Carizmians from Tartary suddenly entered the Holy Land, and became the foes alike of Christians and Moslems. Under these circumstances the Templars and Mussulmen entered into a temporary alliance, and at length effected the destruction of their common enemy. In 1249 the Templars joined the forces of the French King, Louis IX. against Egypt, and captured Damietta. At that time William de Sonnac was Grand Master; and he was succeeded in 1252 by Reginald de Vichier.

The military power of the orders of the Temple and Hospital, in Palestine, was at length completely broken by Bibars, fourth Mamlook Sultan of Egypt. Horrible excesses were committed by both parties in the course of the various conflicts.

In 1291, the Christian dominions in Palestine were reduced to within the narrow confines of the city of

Acre, and the Pilgrim's Castle, a strong fort of the Templars. These were at length invested, and the Grand Master William de Beaujeu took the command of the garrison. The old and feeble were sent away to the island of Cyprus, then the seat of the Latin kingdom, and none remained in the devoted city of Acre, but such as were prepared to suffer martyrdom rather than yield to the infidels. Military engines of the most formidable construction were set in operation by the besiegers: six hundred instruments of destruction were directed against the fortifications, and the battering machines were of such immense size and weight that a hundred wagons were required to transport the separate timbers of one of them. All the military contrivances which the skill of that age could produce were employed to facilitate the assault. After thirty-three days of constant fighting, the great tower or key of the fortifications was thrown down. At length the double wall was forced, and a body of Mamlooks penetrated to the centre of the city. The Knights drove them back with immense carnage, and precipitated their bodies from the walls. At length the number of the Templars was reduced to three hundred, and these fought their way to the strong Temple, at Acre, and shut themselves up. This little band was at length destroyed beneath the ruins of their Temple, which the Sultan had caused to be undermined.

Thus fell the last stronghold of the Christians in Palestine, and with it every reasonable hope of recovering possession of the holy city. No sooner was this the case, than the remaining Templars scattered in different countries soon found their order falling into suspicion and neglect. They began to be considered as a useless body, whose large possessions in Europe might be much better, or at least more agreeably employed. A rancorous spirit was awakened among the clergy, who considered the exemptions and privileges of this order as so much detracted from their just rights. So high did this spirit rise among bishops, priests, and the whole body of the clergy, that the Roman pontiff had to express his grief and astonishment at the conduct of the ecclesiastics, and to threaten them with severe measures. And not only were the Templars obnoxious to the Church; they were also unpopular with the European sovereigns and nobles; in fact, they experienced such neglects, unkind suspicions and misrepresentataions, as commonly fall to the lot of those who cease, from whatever cause, to form the stepping-stones to the promotion of others. To join the Templars, at one period, was to rise to honour and renown in this world, and to obtain (as it was falsely believed) a passport to heaven: to succour them in adverse circumstances did not hold out any prospect of worldly advantage, and therefore the claims of mercy and forbearance were soon forgotten. But the Templars themselves were not free from blame: they interfered in the quarrels of different princes; became secular instead of religious warriors; and thus lost the popularity which attached to them as a holy order of men.

At length their ruin was resolved on by a needy and avaricious monarch, Philip the Fair, who longed to possess himself of a portion of their riches. He found an able accomplice in Pope Clement V., a man whose character is painted by Romish historians in the darkest colours. They prevailed on the Grand Master of the Temple to visit France in 1306, with a small retinue, under the pretence of consulting him on measures relative to the recovery of the Holy Land; while secret agents were at work circulating dark rumours respecting the order, and at length the Templars were openly charged with abominable crimes. Upon this, Philip arrested the members of the order and seized on their real and personal property. The accusations were both absurd and horrible; of the former description were those which charged them with worshipping an idol covered with an old skin having the appearance of a piece of polished oil-cloth, with carbuncles for eyes, bright as the brightness of heaven; also with burning the bodies of deceased brethren and making the ashes into a powder which they administered to the younger brethren in their food, &c., &c.

The tortures practised on this devoted order, in the hope of getting them in the midst of their agonies to confess to these unjust accusations, were of the most revolting description, and ended in death or madness of numbers; but for a long time they were to no purpose. At length forged letters were produced as if from their superior, the Grand Master, exhorting them to do as their persecutors wished, and under this deception several gave way, and made pretended confessions, whose very improbability destroyed the effect intended to be produced by them. And now a similar scene was to be enacted in England. The accusations were opened against them at the episcopal hall, London, after the most industrious endeavours on the part of the Pope's inquisitors, to substantiate some charge, and after many months' imprisonment of the Templars. These venerable men, after all the hardships and dangers of their past lives, were now degraded and tortured by those who had extolled them to the skies; they had to answer to the most absurd allegations, and to choose suffering of the most dreadful kind, or make a false confession. Nothing could be extorted from them, and after another long season of imprisonment they were called before a second council in 1310. They had been subjected to three years of imprisonment and varied sufferings; torture had been skilfully applied by French monks, but, as it had been enacted, "*without the mutilation or disabling of any limb, and without a violent effusion of blood;*" (truly, "the tender mercies of the wicked are cruel;") the Templars knew that by pronouncing a few words of confession they should immediately receive absolution from the Church, and be restored to pardon, peace, and liberty, yet not one of them would depart from the truth, and at the second council they made, instead of a confession, a noble declaration of faith and of their innocency, most unpalatable to the assembled ecclesiastics. Fresh atrocities were then resorted to, and the prisons of the Tower, Aldgate, Ludgate, Newgate, Bishopsgate, and Cripplegate, were the scenes of renewed tortures. At length the constancy of two poor serving brethren was overcome, and their confessions were triumphantly published. An avowal of guilt was also wrung from the chaplain of the order. But the progress made in this way was so slow, that the accusers changed their ground, and endeavoured to convince the Templars of their guilt, in having at former periods received absolution at the hands of the Master, he being a layman. The Templars did not attempt to defend themselves from this charge, and were willing publicly to confess their error in that respect. A sort of compromise was therefore entered into; the Templars made their confession in Latin or Norman French; they were pardoned, and the impression produced on the public mind by their having made *a confession of guilt* was sufficient for the purpose of the ecclesiastics.

Their order was now suppressed by the Pope, and their treasures appropriated by the pontiff and the European sovereigns. Their lands were subsequently given to the Knights Hospitallers, but not till enormous claims on the part of the French king and others had been satisfied. The stipend allowed to the surviving Templars was fourpence a day, and this was so irregularly paid that some of them were near dying of hunger, until charity was in some measure awakened on their behalf. Some of them joined the world once more, and presumed to marry, which gave great offence to the Pope, who ordered them to be separated from their wives. It is remarked by historians respecting those who were foremost in the horrid cruelties practised on the Knights Templars, that every one came to a miserable and untimely end.

## The Round Church at Little Maplestead, Essex.

This edifice, in the opinion of Mr. Rickman, affords the latest specimen of the circular churches. The plan of the building may be considered unique, with its circular portion at the west, and a semicircular chancel. The latter peculiarity is considered, in general, to indicate a Saxon origin; but there are no marks in the church at Little Maplestead of the Anglo-Saxon style of architecture. Mr. Britton judges, from the style of the windows, arches, doorways, &c., in the absence of document, that the erection of the church may be referred to some period between or during the reigns of King John and Henry the Third, both of whom appear to have granted the Knights at Maplestead some privileges. The establishment at Maplestead just alluded to, was that of the Knights Hospitallers, to whom the whole parish, with all its appurtenances, was presented in 1186. They established a preceptory there, under the appellation of Le Hospital, which rapidly increased in wealth and importance, and in less than two centuries received donations from more than seven hundred benefactors in Essex and the adjoining counties. This small and ancient edifice, though much dilapidated, has still a pleasing appearance, and internally possesses a considerable degree of elegance. The principal entrance is at the west end by a porch with three doors; this immediately introduces us into the circular part, which measures thirty feet in diameter, and has a peristyle, consisting of six clustered columns, supporting pointed arches; the whole length of the church is seventy feet. This edifice, is dedicated to St. John, as were most of the churches erected by the Knights Hospitallers.

At the presentation of the parish to that order, there was a church existing at Little Maplestead; but not the present edifice. "The retention of the Norman font," it has been remarked, "at the time of rebuilding the church, is a clear proof that this building (whatever might have been the case in other instances,) was never used for the purposes of baptismal immersion."

Unfortunately a school-room has been erected at the west end of the church, forming a most "unseemly excrescence," and completely concealing the beautiful doorway. The removal of this ill-judged addition would greatly improve the appearance of the church, and would also save the ornaments of the doorway from undergoing an obliterating process by whitewashing, which it now receives when the operation becomes necessary for the school-room. The following just remarks on these injudicious cleansings of our ancient churches, we extract from Wallen's *History of Little Maplestead Church.*

Dr. Franklin, in one of his essays, gives a ludicrous account of the annual whitewashings to which the houses are subjected in America, where the ladies turn their liege lords out of house and home, in order they that may indulge in their favourite propensity.

Although this mania has not seized the ladies of our own country, it seems to be making rapid strides among those of the other sex, who are officially connected with our churches and cathedrals. Nothing is more common in entering such buildings, than to notice alternate streaks of yellow, black, and white, introduced to distinguish the various mouldings of the clustered pillars; and not unfrequently the grotesque heads, introduced as corbels to support the roof, are made, by the assistance of the village painter, to look smilingly and contentedly under the superincument weight.

This beautifying may please the vulgar, but it entirely removes the venerable aspect so impressively assumed by mouldering stone. The awe-inspiring grandeur of our cathedrals and churches, creates an instinctive feeling of their age and connexion with by-gone days; but no sooner has the brush of the "improver" been passed over the graceful and delicate enrichments which characterize the Gothic style of architecture, than that sombre effect, which produces so powerful an impression upon the mind, is entirely destroyed.

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## A PAIR OF SPECTACLES.

CHINESE WEARING SPECTACLES OF ROCK CRYSTAL.

Every one is familiar with the appearance of a pair of spectacles; but it is not generally known, except to those who are unfortunate enough to require their aid, that young persons who wear spectacles do so from a reason totally opposite to that which influences older persons. It is true that an imperfection of sight is the motive in both cases; but this imperfection proceeds from two opposite causes, which we will endeavour to explain.

In order that the eye may convey to the mind a correct picture of an external object, it is essential that the rays of light which proceed from that object should converge to a focus exactly at the retina. If the focalization takes place either a little in front, or a little behind the retina, imperfect vision is the result. As the rays are converged by the crystalline lens, in the front part of the eye, and as convergence of this kind differs in degree in proportion to the curvature of the lens, the eye is so formed by nature that the convergence shall exactly bring the rays to a focus at the retina. Here, however, is an important addition. All distant objects send rays which converge *sooner* behind the crystalline lens, than those which emanate from near objects; and therefore a rigorous maintenance of the relative positions and conditions of the different parts of the eye would render it impossible for all the rays to focalize exactly at the retina. There is, however, an admirable adjusting mechanism in the eye, whereby when we look at a distant object, the crystalline lens is in such a position as to focalize the rays at the retina; and when we look at a near object, some kind of adjustment takes place whereby the refracting mechanism of the eye is adapted to the altered state of things, and the focalization still occurs at the retina. What the nature of this adjustment may be, has never yet been satisfactorily determined. Some philosophers think that the length of the eye, from front to back, is susceptible of change; some think that the cornea, or front of the eye, changes its curvature, or that the pupil varies in diameter; others attribute the adjustment to a change in the shape or position of the crystalline lens, or both. But whatever be the cause, there is abundant proof of the existence in a healthy eye, of a power of adjustment to suit objects at different distances from the eye.

Now in *off-sighted* and *near-sighted* persons this power of adjustment is imperfectly developed. The cornea, the lens, the retina, all may be, individually, fitted for the process of distinct vision: but there are some circumstances which render the power of adjusting that vision to different distances, limited and imperfect. One person, for example, although he can see objects with perfect distinctness a distance of a few inches, sees all distant objects enveloped in a kind of haze or mist; his sight may not be bad, but be limited in its power of adjustment to different distances. Another person may be utterly unable, by the unassisted eye, to read small print, for want of the power to adjust the eye to small distances, and from the small angle under which the letters of a book are seen when held at a

distance: yet such a person may see the details of a distant landscape with great distinctness.

There is something in the physiology of the eye which renders young persons more liable to near-sight than off-sight; whereas, those changes which old age brings about generally operate in producing off-sight. Hence the optical aid which the one requires is different from that of the other. In a near-sighted eye the rays of light converge *too soon*, and we therefore use a concave spectacle-lens to retard the convergence, so that the focalization may take place precisely at the retina; the curvature of the lens being so chosen as just to correct the error of the eye. In an off-sighted eye the rays converge *too slowly*, and we employ a convex lens to hasten the convergence: adapting, as in the other case, the degree of curvature to the amount of the defect.

Mr. Davis, in his excellent work on the Chinese, remarks that a surprising enumeration might be made of instances in which the Chinese appear to have stumbled by mere chance upon useful inventions without the previous possession of any scientific clue. Cases, however, occur in which it may be fairly suspected that they were indebted to the European missionaries. Without knowing any thing, for instance, of that theory of optics which treats of the convergence and divergence of rays of light by lenses of different shapes, they use both convex and concave glasses, or rather crystals, to assist their sight. They employ rock crystal ground and polished with the powder of corundum, "and if anything could prove the Chinese spectacles to be original inventions, or not borrowed from Europe, it would be their very singular size and shape, as well as the strange way of putting them on. The annexed cut represents a pair of these primitive optics slung over the ears with silken strings and weights, imparting by their immense size a most sapient appearance to the wearer."

Spectacles appear to have been first used about the year 1300; and from that time to the present various alterations have been suggested. The simplest form has been the one most used, probably on account of the extra weight which any extra appendages would involve. We will, however, briefly glance at the principal variations from the common spectacles.

Huyghens was induced to believe, from certain considerations connected with the lenses of telescopes, that spectacle-glasses would have less aberration or error if one side were made more convex or more concave, (according to circumstances,) than the other. Such lenses are, in practice, equally curved on both surfaces; but he proposed that the curvatures of the two surfaces should be in the ratio of six to one, the most convex side being towards the object, and the least convex towards the eye. We are not aware that this proposal has ever been acted on to any considerable extent. Dr. Wollaston, indeed, has shown that the principle advocated by Huyghens, however, applicable to the object-glass of a telescope, is not attended with corresponding advantages when applied to spectacle-lenses.

Benjamin Martin, about a century ago, suggested an alteration in spectacles in reference to the plane in which the two glasses lie. He made spectacles in which the two glasses were not situated in the same plane, or with their axes parallel to each other; but were placed inclined to each other, in the same angle as the pencils of rays must proceed from the objects which are viewed. His motive was this:—If the two glasses are in the same plane, and their axes consequently parallel, they are only adjusted for *very distant* objects, whose rays deviate very little from parallelism, whereas near objects send their rays so obliquely to the eyes, that the two eyes very perceptibly converge in regarding them; and thus the axes of the glasses do not coincide with the axes of the eyes. Martin thought, therefore, that the framework of the spectacles should be so made as to admit of adjusting the plane in which the two glasses were placed. He made some spectacles in which the lenses were fixed in the frame so that the axes of the two glasses were inclined; and this inclination was such that the two axes met in a point situated at the same distance from the glasses as the focal length of each glass; or, in other words, the foci of the two glasses were brought into one common point.

Dr. Franklin describes a curious pair of spectacles which he used occasionally to wear.

The same convexity of glass, (says he,) through which a man sees clearest and best at the distance proper for reading, is not the best for greater distances. I, therefore, had formerly two pairs of spectacles which I shifted occasionally; as in travelling I sometimes read, and often want to regard the prospects. Finding this change troublesome, and not always sufficiently ready, I had the glasses cut out, and half of each kind associated in the same circle; the least convex, for viewing distant objects, in the upper half of the circle; and the most convex, proper for reading, in the lower half of the frame. By this means, as I wear my spectacles constantly, I have only to move my eyes up or down, as I want to see distinctly far or near; the proper glasses being always ready. Although I cannot distinguish a letter, even of large print, by the naked eye, with the assistance of this invention my eyes are as useful to me as ever they were; and if all the other defects and infirmities of old age could be as easily and cheaply remedied, it would be worth while to live a good deal longer.

It occurs to us that the existence of a line of junction immediately in front of the pupil of the eye is a serious objection to this kind of spectacles.

Mr. Richardson, an optician of London, soon after proposed to attain a similar object by fixing two pairs of glasses to one frame. He applied extra glasses in front of the common single lenses, and fitted with joints whereby the extra glasses could at pleasure be turned out of the way, either upwards or sideways. Any two focal powers could thus be combined in one frame; for instance, the frame might be fitted with such lenses as are most proper for distant objects; but by turning down the extra lenses, the power might be increased in any desired degree. A modification of this construction has been frequently used in later years, by having coloured glasses so attached to the frame of common spectacles, that they could be turned down at any time to shield the eye from the bright glare of the sun.

An improvement was suggested by Mr. Hawkins, some years ago, with a view to obviate the necessity of supporting the spectacles on the nose. He introduced a pair of extra arms or joints, which passed upwards over the temples; these, in addition to the common horizontal joints, held the spectacles to the head without the necessity of resting them on the bridge of the nose, and enabled the wearer to place them at any required distance from the eye.

Dr. Wollaston, in his *periscopic* spectacles, sought to obviate the defect arising from the refraction of the rays of light which pass through a spectacle lens near its circumference. All objects seen *obliquely* through spectacles, as they must be when viewed through the glass near its margin, appear distorted and indistinct; and Wollaston thought that by making the substance of the lens curved in the manner of a hollow globe, each portion of it might be situated nearly at right angles to the direction of the sight, and thus render the vision more correct and distinct. This could only be done by making the lens *concave* towards the eye, whether the spectacles were for an off-sighted or a near-sighted person; and, therefore, the outer surface would have its curvature regulated to this peculiar construction. Instead, therefore, of having double-convex lenses for off-sight, and double-concave for near-sight, he proposed—that all the lenses should be concavo-convex, the concave side being near the eye, and the convex side towards the object; that for off-sight the convex surface should be more curved than the concave; and that for near-sight

the concave surface should be more curved than the convex.

Chamblant, of Paris, has modified Wollaston's method in a remarkable manner. Instead of grinding the lenses to spherical surfaces, as is the case in ordinary spectacles, he has ground them into *cylindrical* surfaces. That is, each surface is so curved as if it formed part of a cylinder; and the two are so arranged that while the axis of one cylindrical surface is vertical, that of the other is horizontal. The object of this arrangement is to correct certain discrepancies to which ordinary lenses are subject. Professor Airy, the Astronomer Royal, has communicated to a scientific journal an account of a contrivance which he has adopted to remedy a partial defect in one of his eyes, and which consists in the use of a pair of spectacles in which the cylindrical and the spherical curvature of the lenses are ingeniously combined.

About fifteen years ago M. De la Court took out a patent for a novel kind of spectacles which should enable the spectator to see more ways than one. The contrivance consists in having two small pieces of silvered glass or two small metallic mirrors so hinged to the frame of the spectacles as to stand at any angle with respect to the eye, and thus enable the person to see objects at the side of him and even behind him, by reflexion in the polished surfaces of the little mirrors. The mirrors might be attached to the frame with or without the common spectacle-lenses.

We may remark, in conclusion, that the very small extent to which any of these proposed forms of spectacles have been used, seems to indicate that the common forms are on the whole the best, although others may have advantages in certain circumstances. One word we would suggest to those who, in comparatively early life, feel the necessity of using spectacles for near-sight. Do not select such lenses as will make objects appear very clear but greatly diminished in size; this can only occur by using glasses of such high power, as will injure the eye, and make it gradually more and more near-sighted. If you are willing to put up with the inconvenience of a little indistinctness in *distant* objects, it will be better for the eye than to use a higher power whereby distinct vision will be obtained. Yield cheerfully to a small amount of imperfection in the matter.

## ORNAMENTAL AVIARIES.

It is somewhat surprising that so little pains has been expended on the improvement of aviaries; and that a portion of the care and expenditure so freely bestowed on greenhouses and conservatories has not been extended to so pleasing an ornament of pleasure-grounds as a really handsome and well appointed aviary might be made to be. As a question of expense the aviary has the advantage over the greenhouse, for it can be tended by an old woman or a boy, while foreign plants need the care of an experienced gardener. The cost of food for the birds would be found far less than the difference of wages.

We have recently met with a notice of an aviary which appears to unite many advantages, and to be one of the best of its kind, and we think our readers will agree that to place the birds in such a home, with abundance of provisions and every facility for building their nests and rearing their young, is not to be considered in the light of cruelty, or to be compared for a moment with solitary imprisonment in a cage.

The kind of aviary, then, which we would recommend, varies in size, according to the convenience of the owner, and according to the space which it is desirable to allot to such a purpose; but, under any circumstances, it should inclose a space of ground sufficient to allow of the growth of considerable shrubs, in which the birds may nestle and find shelter. It should also, if possible, be built over a brook, that the birds may be supplied with running water; but where this is impracticable, care must be taken that fresh water may be constantly afforded them. The ground within the aviary may be covered with turf, and divided by gravel walks. The evergreens, most suitable to be planted within its bounds are phyllerea, holly, laurel, Portugal laurel, lauristinus, yew, box, cypress, &c. The aviary must face the south or west, and be properly sheltered from the north and east winds. The building should be principally of wire and open to the air, but there should be wings on either side, protected by a roof, where delicate birds might retire, and where more complete shelter from rain or sunshine might be obtained. One of these wings might be so constructed as to communicate with the rest of the building in summer, but to be capable of separation from it in winter. This apartment might be faced with glass, and have the advantage of being heated in winter to the temperature necessary for some of the foreign birds. The aviary should be provided with several seed boxes, so contrived that only a certain portion of the seed may fall within reach of the birds at a time, and the divisions in the boxes should be numerous, that the larger birds may not tyrannize over the weaker, and keep them from their food.

When we consider that the excursions of birds in the air, in a state of nature, are greatly influenced by their search after food, and by the necessity which often exists for their seeking far and wide before they are able to procure it, there seems no reason to suppose that we are affecting their sense of pleasure in any considerable degree, when we limit their flight to the space afforded by such an aviary as we have described, and, at the same time, present them with an abundant supply of all that is necessary to their existence. When our little prisoners reward us with their song, it is a tolerable proof that they are happy.

If their song (says Macculloch) is the effect of food, it is because to the inferior animals food is the great enjoyment. It is a sickly sentimentality, or the cant of imaginary politics, to pity the singing-bird in confinement: it is happy, because it is fed; and its song is the expression of that happiness. They salute those whom they know with songs, they emulate each other in song, the mere sound of music excites it, and a single songster will rouse the whole grove into harmony.

Of the birds fitted for the aviary the *granivorous* stand first; they give little trouble, and are almost sure to do well: the *insectivorous* require much care to keep them in health, but are too valuable to be excluded on that account: the *carnivorous* are not of course to be admitted. Many birds of the genus Fringilla are very ornamental to the aviary, especially the goldfinch, mountain-finch, redpole, chaffinch, linnet, tree-sparrow, twite, and common canary bird. These thrive well on the ordinary food of the aviary, with the addition of a plentiful supply of greens. The name "linnet" has been given to several of the finches. These are the same birds called linties in Scotland, and both words simply mean that the birds eat the seeds of *lint*, or flax (*linum*), of which, as well as the seeds of hemp, and all the smaller mucilaginous and oily seeds, the whole tribe is particularly fond.

The genus *Turdus* contains the mellow-toned song-thrush, the melodious blackbird, the missel-thrush, ring ouzel, &c. These are charming denizens of the aviary, and will pour forth many a pleasant strain from the shade of its miniature groves. The genus *Loxia* may supply the cross-beak, the bullfinch, and greenfinch. The first-named, though extremely curious and amusing, will be found mischievous in barking the trees, and destroying the woodwork of the aviary. We cannot recommend the genus *Alauda* as fit to be kept in confinement. The nature of the skylark, for instance, especially fits it for soaring in the clouds, and to repress that powerful instinct seems positive cruelty. Besides, these birds are not so easily kept as many others, and it is far

better to let them seek their natural food. The usual substitute is barley-meal and grated liver, a supply of which must be given to such of the inhabitants of an aviary as feed on worms, &c.

The food of the genus *Sylvia* consists principally of insects, and they are, therefore, troublesome tenants of the aviary. The greater number of these birds are also migratory, and to keep them through the winter the temperature of their apartments must be regulated accordingly. Some of the species succeed well in the common aviary, as the hedge-warbler, redbreast, common wren, and golden-crested wren. On account of the courageous disposition of the redbreast, he will be found troublesome in the aviary, beating birds twice his size, and making himself master of the place.

The great titmouse and the blue titmouse are very pretty birds, and are the species most easily kept of the genus *Parus*.

The turtle-dove, and several foreign species of the *Columbæ*, may be admitted into the aviary, especially the elegant white variety of the Barbary dove.

The common partridge and the red-legged partridge are very pretty birds, and many beautiful foreign species of the same genus (*Perdix*) might be added to the aviary. An elegant appendage may also be found among the *gallinaci*, such, for example, as the golden pheasant.

The wagtail (*Motacilla flava*) is a graceful little creature, and a very pretty inmate of the aviary.

The general supply of food for the aviary may consist of buck-wheat, hemp, rape, and canary-seeds, barley-meal and grated liver. Snails, slugs, and worms should be also frequently supplied, together with groundsel, chickweed, lettuce, water-cresses, and the seeds of plaintain, dock, and thistles.

Thus furnished, the aviary becomes a source of attraction to birds that have their liberty. We are told that a pair of sparrows once entered an aviary through a defective part of the roof, and naturalized themselves completely in the place, so that they seldom went out, and had a nest and eggs in their voluntary prison.

This being the case, those who have the means at their disposal may surely thus enjoy the gratification of studying the forms and habits of different varieties of the feathered tribe, without subjecting themselves to the charge of cruelty. And within an aviary of the extent we have been describing, there would be much opportunity for observing the habits and flight of birds, which could scarcely be attained (with respect to the foreign species) in any other way. A popular writer on the natural history of birds, thus speaks of their varied motions:—

The doctrine of motion is one of the most useful branches of knowledge, and nowhere can that be studied so easily, or under so many varieties and modifications, as in the feathered tribes. The birds move through the air in all directions, upwards, downwards, and horizontally: they run upon the earth, over all sorts of surfaces, on firm ground, over quagmires, or on long grass; and some of them, aided by the action of their wings, walk the waters, and row themselves by their feet, while the weight of the body is suspended in the air. They swim, they dive, they run along on the bottom of the shallows, or through the water in the deeps; and, in short, they perform every species and almost every rate of motion that can be imagined, from a velocity which surpasses the hurricane in the utmost of its fury to gentle gliding, scarcely perceptible to the eye. All these varied motions are performed by means of organs, adapted so much more nicely to their purposes than even our finest mechanical contrivances, that they may be said to differ from those in kind more than in degree; and though we may take many useful hints from them, they are far above our imitation. That the same bird should be able, without any change of substance, and by the action of its mechanical structure alone, to ascend and descend at pleasure, either in air or in water, is in itself a subject well worthy of the most profound investigation.

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### THE FIRST DEAR THING.

The first dear thing that ever I loved
Was a mother's gentle eye,
That smiled as I woke on the dreamy couch
That cradled my infancy.
I never forget the joyous thrill
That smile in my spirit stirred,
Nor how it could charm me against my will,
Till I laughed like a joyous bird.

And the next fair thing that ever I loved
Was a bunch of summer flowers,
With odours, and hues, and loveliness,
Fresh as from Eden's bowers.
I never can find such hues again,
Nor smell such a sweet perfume;
And if there be odours as sweet as these,
'Tis I that have lost my bloom.

And the next fair thing I was fond to love,
Is tenderer far to tell;
Twas a voice, and a hand, and a gentle eye,
That dazzled me with its spell.
And the loveliest things I had loved before
Were only the landscape now,
On the canvass bright, where I pictured her,
In the glow of my early vow.

And the next good thing I was fain to love
Was to sit in my cell alone,
Musing o'er all these lovely things
For ever, for ever flown.
Then out I walked in the forest free,
Where wantoned the Autumn wind,
And the coloured boughs hung shiveringly
In harmony with my mind.

And a Spirit was on me that next I loved,
That ruleth my spirit still,
And maketh me murmur these sing-song words,
Albeit against my will.
And I walked the woods till the winter came,
And then did I love the snow;
And I heard the gales through the wildwood aisles
Like the Lord's own organ blow.

And the bush I had loved in my greenwood walk,
I saw it far away,
Surpliced with snows, like the bending priest
That kneels in the church to pray.
And I thought of the vaulted fane on high,
Where I stood when a little child,
Awed by the lauds sung thrillingly,
And the anthems undefiled.

And again to the vaulted church I went,
And I heard the same sweet prayers,
And the same full organ-peals up sent,
And the same soft soothing airs;
And I felt in my spirit, so drear and strange,
To think of the race I ran,
That I loved the sole thing, that I knew no change,
In the soul of the boy and man.

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Athenodorus, the philosopher, by reason of his old age, begged leave to retire from the Court of Augustus; and as he was taking his departure, "Remember," said he, "Cæsar! whenever you are angry, to say or do nothing, before you have repeated to yourself the four-and twenty letters of the alphabet."

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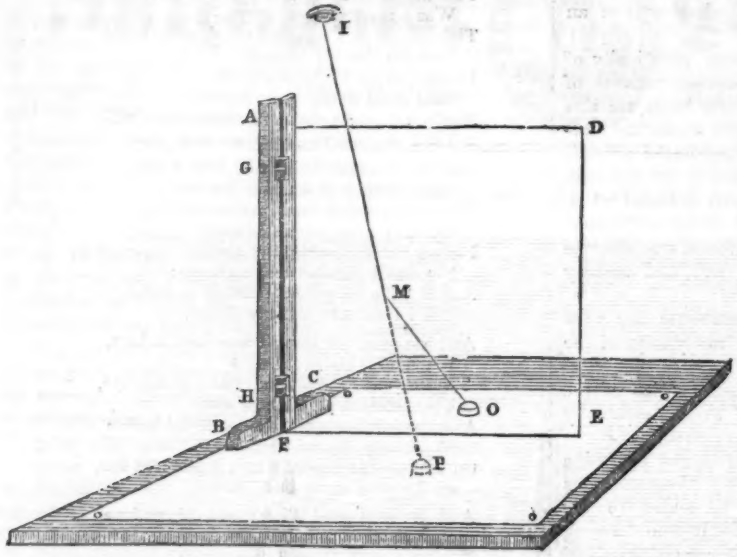
Patience is the guardian of faith, the preserver of peace, the cherisher of love, the teacher of humility: Patience governs the flesh, strengthens the spirit, sweetens the temper, stifles anger, extinguishes envy, subdues pride; she bridles the tongue, refrains the hand, tramples upon temptations, endures persecutions, consummates martyrdom: Patience produces unity in the church, loyalty in the state, harmony in families and societies; she comforts the poor and moderates the rich; she makes us humble in prosperity, cheerful in adversity, unmoved by calumny and reproach; she teaches us to forgive those who have injured us, and to be the first in asking forgiveness of those whom we have injured; she delights the faithful, and invites the unbelieving; she adorns the woman, and approves the man; is loved in a child, praised in a young man, admired in an old man; she is beautiful in either sex and every age.—Bishop Horne.

## A CHEAP CAMERA LUCIDA




Sir John Robison, a distinguished cultivator of science at Edinburgh, has devised a very simple and cheap Camera Lucida, whereby small objects, such as coins, flowers, leaves of plants, &c., may be copied with considerable ease and accuracy. He exhibited the instrument before the Society of Arts for Scotland during the last year; and at the request of the Society sent a drawing and description of the instrument, which were afterwards published in the *Edinburgh Journal of Science*.

It will be remembered that an account was given, in No. 368 of the *Saturday Magazine*, of Dr. Wollaston's Camera Lucida, in which the principle of optical reflexion was shown to be the source of the effect produced. The same principle, but modified in an ingenious manner, distinguishes the new contrivance which we are about to describe.

Dr. Wollaston's Camera Lucida consists mainly of a prism of clear glass, having four plane sides, two acute angles, one obtuse angle, and one right angle. The object to be copied, such as a picture, is placed perfectly upright or vertical; and the prism is held in front of it, with the side nearest to the picture quite vertical, and the right angle uppermost and near to the picture. Under these circumstances, rays of light proceeding from the picture or object, emanating from it in a horizontal direction, impinge on the adjacent surface of the glass, and pass through the substance of the glass to the hinder surface. Here the particular angle given to the glass is such, that the ray is reflected internally from the lower surface to the hinder, thence again reflected in a vertical direction to the upper surface, through which it passes. If therefore an eye be placed above the upper surface of the prism at this point, and be directed downwards, a distinct copy of the object will be seen. To transfer this copy to paper is the object of the other parts of the instrument. On a flat table immediately beneath the prism is laid a sheet of paper; and an eye-hole is so adjusted that while one half of it gives an uninterrupted view of the paper, the other half allows the reception, by the eye, of the reflected image of the object; and a pencil, held by the hand between the prism and the paper, is enabled to delineate the object reflected.

In Sir John Robison's contrivance, the principle of *external* reflection is adopted instead of *internal*, not as being more efficacious, but on account of the cheapness and simplicity of the arrangement. The instrument depends, in fact, on two optical laws; viz., 1st, that when light is reflected from a polished surface, the angle of reflection is equal to the angle of incidence; that is, that if the incident ray deviates from the perpendicular any number of degrees in one direction, the reflected ray will deviate just as much in the opposite direction; 2nd, that the form of an image is not distorted when the rays from the object producing it pass through a transparent medium whose surfaces are parallel. The manner in which these two laws are brought into requisition may be seen in the cut which accompanies this article.

The sheet of paper whereon the drawing is to be made is laid down flat and smooth on a table; and a piece of mechanism, A B E D, placed upon it. This consists of a frame of wood, A B C, shaped somewhat like the letter T, to which a piece of clear plate glass F E D, is attached. The glass is fixed by one edge in a groove cut in the piece of wood, and there secured by wedges G and H. If the frame of wood be correctly made, the glass will be exactly at right angles to the sheet of drawing paper; and it may be placed on any part without being fixed, on account of the broad foot, B C, of the stand. Any small object to be copied is to be laid on the paper, and the eye of the draughtsman to be directed through the glass in the following manner. The draughtsman stands with the frame, A B, in front of and nearest to him, and places the object, O, on the paper at the *left* hand of the glass. The head is held a little to the left of the frame, and then directed towards the middle of the glass, so as to look through the point M to the spot P on the paper. The reflexion from the object O, also occurring at M, seems to the eye to coincide with the spot P, and by tracing with a pencil at P, a clear copy of the object can be obtained. There is, in fact, a superposition of two effects; transmitted light from the spot P to the eye, and reflected light from the object O to the eye, the spot M being the point where these two effects coalesce.

The advantage of this form of instrument is its great simplicity and cheapness, since the possession of a small piece of plate glass would enable an ingenious person to complete the apparatus. It is easy to see that there may be many ways of fixing or adjusting the glass; since the only requisite is, that the plane of the glass should be exactly at right angles with the plane of the paper. Sir John Robison, in his communication to the Society of Arts for Scotland, remarks, in reference to the utility of this Camera Lucida:—

Its applicability to the delineation of objects is confined to such as are of small size, and as may be laid beside it on the drawing-board. It is in this way particularly calculated for the accurate representation of botanical specimens, which it will render in their true proportion without trouble in adjustments. The disadvantage of the limited range of this instrument is in some measure compensated by the facility of its application, and by its cheapness and simplicity.

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In other men we faults can spy,
And blame the mote that dims their eye,
Each little speck and blemish find,
To our own stronger errors blind.—Gay.

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